BPL is a system that is being tested, and by the way already rejected in many countries, to provide broadband internet service via powerlines to power outlets in homes and is a last mile technology. The system uses radio frequencies that will radiate and cause interference to several licensed communications services including Amateur Radio. The frequencies BPL uses in general is 1 to 80 megahertz (MHz). Of particular interest is the band of frequencies known as HF, which is 1 to 30 MHz . This part of the radio spectrum has very special natural properties not found elsewhere. With this band, one can communicate around the world with very minute power levels. This is due to the fact that radio waves in this band can bounce off the ionosphere multiple times to get to a faraway destination. This same property will propagate interference produced by BPL to foriegn lands, and there has been no study of this inique propagation property by BPL proponents. Other portions of the radio spectrum, like that used by 802.11 wireless LANs, are essentially line-of-sight. This means that the signals cannot bend or bounce off the ionosphere, but they can only propagate like light in a straight line and cover much shorter distances.

The medium of BPL, open powerlines, unlike other broadband mediums such as copper twisted pair, fiber, and coaxial cable, is inherently unsuited for carrying the frequencies BPL uses. Power lines, twisted pair, and coaxial cable all act like natural low pass filters, meaning higher frequencies are attenuated more than lower frequencies when attempting to transmit them through the medium. In general, twisted pair is suitable up to 100 MHz and coaxial cable can go up to about 3 GHz. Power lines are suitable for up to perhaps 350 kHz or so. The exact figure will vary and is unimportant for this discussion, but note that this is kilohertz, not megahertz or gigahertz. The medium of BPL is simply not suited for broadband data.

The other property of the medium chosen for BPL is its radiating capability. Unlike all other broadband mediums, power lines are excellent radiators of the frequencies BPL uses. Copper twisted pair, coaxial cable, and fiber are all inherently non-radiating self-shielded mediums. Powerlines act like a natural antenna and lose the BPL signal out into the air. The resulting interference can vary from a noticeable noise to a deafening roar on today's sensitive radio equipment which drowns out all possible communications.

BPL has been tested and deployed on a limited basis in other countries and was rejected in most places due to interference issues. BPL vendors may claim new technology and advances have now made it possible, but the fact is they cannot change the laws of physics. High speed data must occupy a certain amount of bandwidth and power lines which were designed to operate at 60 hertz will radiate radio frequency energy that is applied to them. Only changing power line construction (i.e. coaxial cable) would eliminate this radiation. BPL proponents reject this as being too costly, but that would be the cost to make this a real viable technology.

Users of the affected radio spectrum cannot be relocated, or at least not economically or in a timely

manner. All of the services that use the HF bands require the characteristics that only the HF spectrum exhibits. There would also be huge international treaty implications with any relocation, and the interference issues naturally propagate to foriegn lands as well via ionospheric propagation. Relocating government and military services alone would take years as the FCC and the NTIA and others would have to structure a migration plan. Perhaps the largest issue to tackle though is where to move these services in what is an already overcrowded spectrum.

Destroying a large portion of the wireless HF spectrum is not justifiable because it benefits more people. There are many examples of this in society where reallocation of a resource would benefit more people, but it would be detrimental long term to the people and the resource itself. Right now, Amateur frequency allocations belong to the people internationally and can be enjoyed in nearly every country by simply passing a test and getting licensed. Once they are given to a business interest, they cease to be the public's and can only be used as a customer of that business. BPL impacts other groups including government, military, shortwave, aviation, maritime communications, and CBers, so this would have national security and international implications as well. BPL has been linked in some rhetoric with increasing homeland security. BPL in fact takes huge chunks of spectrum away from government agencies directly tasked with protecting the country.

The scalability of BPL is questionable. Chunks of HF spectrum must be reused between repeater/injection point segments. With customer bandwidth requirements going up, systems will need to be segmented in a cellular fashion. This exacerbates the interference issue as more frequency chunks are in use in a given area. More avoidance of frequencies will be needed, making less spectrum available for use by BPL. The frequency chunks in use will need to be smaller to enable tighter frequency reuse, and the available bandwidth per injection point will get to a point where it won't be sufficient.

BPL is also lacking on the regulatory front. It has no protection from interference from licensed wireless services. This means your BPL provider has no recourse if a licensed wireless station knocks out your BPL service regularly. If BPL interferes with a licensed wireless station, the BPL provider must cease to operate the system if the interference problem cannot be solved. While on the surface one would think that this would inherently protect wireless communications, it places a huge burden on such services to expend time and money identifying and seeking resolution to interference issues. With such a weak regulatory basis and a system that is immediately at odds with incumbent services, why would anyone want to depend on BPL to provide reliable broadband?

The interference mitigation techniques the FCC is proposing comes down to moving interference around in the HF spectrum until no one complains. The problem with this is that it's very difficult to find open space in this spectrum that won't affect anyone. The NTIA alone has over 18,000 frequencies in use. BPL carriers will receive an interference complaint, reconfigure (notch) their

system to use other frequencies, only to interfere with another service. As BPL systems need more spectrum to feed a growing number of customers, it will have an increased demand for bandwidth, this interference avoidance juggling act will soon become impossible.

Radio Amateurs have been the most vocal in defending the radio spectrum, especially in internet forums. Amateurs do not oppose broadband deployment, and in fact welcome it as most are born techies and use the Internet extensively. Some Amateur applications such as VHF repeater linking systems and automatic position reporting systems actually use the Internet for connectivity and messaging. It is the inherent ill effects of BPL on the wireless HF spectrum which Amateurs vehemently oppose.

In summary, power companies should be building for broadband dominance in the coming decades with viable technology such as fiber, not for the next year or two with doomed-for-obsolescence technology. Wireless spectrum should be used for wireless applications, not to accommodate a wired network that pollutes this naturally special spectrum. The risk to critical licensed communications services is too great, the technological and regulatory foundation of BPL is too weak, and when compared head-to-head with other technologies, BPL loses on both the business model and technical capability sides. Please do not procede with this technology. We need our HF spectrum for emergency communications. Just look what happened during 911, there was no communications available except for amateur radio, and the same goes for the recent hurricane Katrina area and many other examples. Please don't ruin a great natural resource - The HF Spectrum!